

Name _____

Date _____

LESSON
12.2**Practice B**

For use with pages 802–809

Tell whether the sequence is arithmetic. *Explain why or why not.*

1. 2, -5, -12, -19, -26 2. 3, 5.5, 8, 10.5, 13 3. 0, -5, -10, -12, -20
 4. 2, 4, 8, 16, 32 5. 1, 2, 4, 7, 11 6. $\frac{3}{4}, \frac{7}{8}, 1, \frac{9}{8}, \frac{5}{4}$

Write a rule for the n th term of the arithmetic sequence. Then find a_{10} .

7. -4, 2, 8, 14, 20 8. -25, -29, -33, -37, -41
 9. $\frac{1}{4}, 0, -\frac{1}{4}, -\frac{1}{2}, -\frac{3}{4}$ 10. $d = 5, a_5 = 33$
 11. $d = 2, a_6 = 10$ 12. $d = -3, a_{12} = -34.5$

Write a rule for the n th term of the arithmetic sequence that has the two given terms.

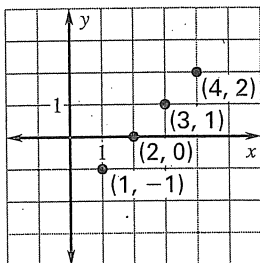
13. $a_{20} = 240, a_{15} = 170$ 14. $a_6 = 13, a_{14} = 25$ 15. $a_9 = -14, a_{15} = -20$
 16. $a_8 = -44, a_5 = -32$ 17. $a_{16} = 6, a_{20} = 7$ 18. $a_7 = \frac{6}{7}, a_9 = \frac{2}{3}$

Find the sum of the arithmetic series.

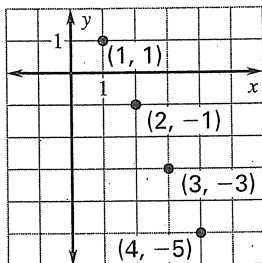
19. $\sum_{i=1}^8 (3i - 1)$ 20. $\sum_{i=1}^{20} (-2i + 14)$ 21. $\sum_{i=1}^{15} (-i - 6)$
 22. $\sum_{i=6}^{12} (-5i + 17)$ 23. $\sum_{i=4}^9 (6i - 30)$ 24. $\sum_{i=8}^{16} (-11 + 4i)$

Write a rule for the sequence whose graph is shown.

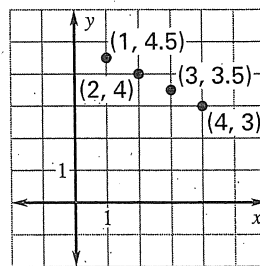
25.



26.



27.



28. **Auditorium** An auditorium has 25 rows. The first row has 10 seats, and each row after the first has 1 more seat than the row before it.
 a. Write a rule for the number of seats in the n th row.
 b. Find the total number of seats in the auditorium.

Lesson 12.1, continued

9. a. 3.14158739; 4 decimal places
b. 3.141592645; 7 decimal places

Lesson 12.2

Teaching Guide

1. yes; -7, -4, -1, 2, 5, 8; 3 2. no; -8, -4, -1, 3, 6, 10; 4, 3, 2, 3, 4 3. *Sample answer:* An arithmetic sequence is a sequence in which the difference between consecutive terms is constant.

Investigating Algebra Activity

1. a. 2, 5, 8, 11, 14; 40; 8; 40 b. 1, 8, 15, 22; 46; $\frac{23}{2}$; 46 c. -1, 1, 3; 3; 1; 3

2. They are the same. 3. Calculate the average of the first and last terms, and then multiply by the number of terms in the sequence.

4. $\text{Sum} = n \left(\frac{a_1 + a_n}{2} \right)$ 5. $\text{Sum} = 4 \left(\frac{3 + 21}{2} \right) = 48$

Practice Level A

1. yes; Each difference is 3. 2. no; Differences are not constant. 3. yes; Each difference is 2.

4. yes; Each difference is -4. 5. no; Differences are not constant. 6. no; Differences are not constant. 7. $a_n = 4 + 3n$; $a_8 = 28$

8. $a_n = 7 + n$; 15 9. $a_n = 5 - 2n$; -11

10. $a_n = -9 + 2n$; 7 11. $a_n = 4n$; 32

12. $a_n = -10 - 5n$; -50 13. $a_n = -3 + 3n$

14. $a_n = 9 + n$ 15. $a_n = -10 + 5n$

16. $a_n = 15 + 5n$ 17. $a_n = -48 + 4n$

18. $a_n = 200 - 5n$ 19. 14 20. 63 21. 168

22. 56 23. 72 24. -65 25. $a_n = 9 - 2n$

26. $a_n = -4 + 2n$ 27. $a_n = 6 - n$

28. a. $a_n = 123 + 2n$ b. 133 lb c. 645 lb

Practice Level B

1. yes; Each difference is -7. 2. yes; Each difference is 2.5. 3. no; Differences are not constant. 4. no; Differences are not constant.

5. no; Differences are not constant. 6. yes;

Each difference is $\frac{1}{8}$. 7. $a_n = 6n - 10$; 50

8. $a_n = -4n - 21$; -61 9. $a_n = \frac{1}{2} - \frac{1}{4}n$; -2

10. $a_n = 5n + 8$; 58 11. $a_n = 2n - 2$; 18

12. $a_n = -3n + 1.5$; -28.5 13. $a_n = 14n - 40$

14. $a_n = \frac{3}{2}n + 4$ 15. $a_n = -5 - n$

16. $a_n = -12 - 4n$ 17. $a_n = \frac{n}{4} + 2$ 18. $\frac{6}{n}$

19. 100 20. -140 21. -210 22. -196

23. 54 24. 333 25. $a_n = n - 2$

26. $a_n = -2n + 3$ 27. $a_n = -\frac{n}{2} + 5$

28. a. $a_n = n + 9$ b. 550

Practice Level C

1. no; Differences are not constant.

2. no; Differences are not constant.

3. yes; Each difference is -35.

4. $a_n = -19 + 7n$; 135 5. $a_n = 59 - 14n$; -249

6. $a_n = \frac{5}{8}n$; $\frac{55}{4}$ 7. $a_n = 242 - 11n$; 0

8. $a_n = -94 + 14n$; 214 9. $a_n = 46 + 3.8n$; 129.6 10. $a_n = -59 + 8n$ 11. $a_n = 47 - 13n$

12. $a_n = -3.5 + 3.5n$ 13. $a_n = -0.2 + 7.2n$

14. $a_n = 11 - 0.9n$ 15. $a_n = \frac{3}{5} + \frac{2}{5}n$

16. no; Each pair of terms yields a different common difference. 17. yes; Each pair of terms yields a common difference of 3. 18. yes; Each pair of terms yields a common difference of -5.

19. 112 20. 25 21. 28 22. -225 23. -45

24. 90 25. 9 26. 7 27. 11

28. a. $a_n = 64.57n$ b. \$1743.39 c. \$72.5

29. 15

Study Guide

1. yes 2. no 3. no 4. yes 5. $a_n = 15 + 4n$; 75 6. $a_n = 3 + 2n$; 33 7. $a_n = 5 - n$; -10

8. 209 9. 13,500

Problem Solving Workshop:

Worked Out Example

1. 549 2. 126 3. $a_n = 2 + 1.5n$; \$21.50

Challenge Practice

1. 2850 2. 4455 3. 2500 4. 10,100

5. a. 7 b. $a_n = \frac{11}{2} + \frac{3n}{2}$ 6. -8

7. a. arithmetic sequence; common difference = d b. arithmetic sequence; common difference = dC c. not an arithmetic sequence

LESSON
12.2
Practice C

For use with pages 802–809

 Tell whether the sequence is arithmetic. *Explain why or why not.*

1. 17, 35, 57, 75, 97, ... 2. 9, 6, 3, 0, 3, 6, 9, ... 3. 23, -12, -47, -82, ...

 Write a rule for the n th term of the arithmetic sequence. Then find a_{22} .

4. -12, -5, 2, 9, ... 5. 45, 31, 17, 3, ... 6. $\frac{5}{8}, \frac{5}{4}, \frac{15}{8}, \frac{5}{2}, \dots$
 7. $d = -11$, $a_{13} = 99$ 8. $d = 14$, $a_6 = -10$ 9. $d = 3.8$, $a_8 = 76.4$

 Write a rule for the n th term of the arithmetic sequence that has the two given terms.

10. $a_{11} = 29$, $a_{20} = 101$ 11. $a_6 = -31$, $a_{14} = -135$ 12. $a_7 = 21$, $a_{13} = 42$
 13. $a_6 = 43$, $a_{15} = 107.8$ 14. $a_{10} = 2$, $a_{22} = -8.8$ 15. $a_8 = \frac{19}{5}$, $a_{12} = \frac{27}{5}$

 Tell whether it is possible that the sequence with the three given terms is arithmetic. *Explain why or why not.*

16. $a_2 = 8$, $a_4 = 16$, $a_6 = 26$ 17. $a_3 = 21$, $a_5 = 27$, $a_{12} = 48$ 18. $a_2 = 0$, $a_3 = -5$, $a_9 = -35$

Find the sum of the arithmetic series.

19. $\sum_{i=1}^8 (2i + 5)$ 20. $\sum_{i=1}^{10} (i - 3)$ 21. $\sum_{i=1}^7 (3i - 8)$
 22. $\sum_{i=1}^9 (5 - 6i)$ 23. $\sum_{i=1}^9 (25 - 6i)$ 24. $\sum_{i=1}^{15} \frac{3}{4}i$

 Find the value of n .

25. $\sum_{i=1}^n (-3 + i) = 18$ 26. $\sum_{i=1}^n (5i + 3) = 161$ 27. $\sum_{i=1}^n 3i = 198$

28. **Part Time Job** You take a part time job that involves working the same hours each week. Your take home pay for 4 weeks is \$258.28.

- Write a rule for the total amount of take home pay you earn by the end of the n th week.
- What is the total amount of take home pay earned after 27 weeks on the job?
- After several weeks, your total gross pay is \$507.50. Four weeks later, your total gross pay is \$797.50. What is your weekly gross pay?

29. **Soup Cans** You are stacking soup cans for a display in a grocery store. Your manager wants you to stack 120 cans in layers, with each layer after the first having one less can than the layer before it. One can should be in the top layer. If you must use all 120 cans, how many cans should be in the first layer?